

## IN THE CLAIMS:

Please amend the claims as follows:

1. **(Currently Amended)** A method for producing a membrane-electrode structure, comprising the steps of:

applying ~~on a sheet substrate~~ a catalyst paste onto a sheet substrate,  
wherein the catalyst paste comprises ~~comprising~~ an electron conducting material  
supporting a catalyst and an ion conducting material; ~~and~~

drying the catalyst paste ~~same, so as to form~~ **[[a]]** an electrode catalyst  
layer;

thermally transferring said electrode catalyst layer onto each side of a  
polymer electrolyte membrane, ~~so as to form a laminated body, wherein~~ such  
~~that~~ said electrode catalyst layer is connected to each side of said polymer  
electrolyte membrane;

applying ~~on a carbon substrate layer~~ a first slurry onto a carbon substrate  
layer, wherein the first slurry comprises ~~comprising~~ a water-repellent material and  
an electron conducting material; ~~and~~

drying the first slurry ~~same to form a water-repellent layer; and then~~

applying ~~on said water-repellent layer~~ a second slurry onto said water  
repellent layer, wherein the second slurry comprises ~~comprising~~ an electron  
conducting material and an ion conducting material; ~~and~~

drying the second slurry ~~same to form a hydrophilic layer, so as to form~~  
wherein a diffusion electrode consisting of said carbon substrate, said water-  
repellent layer and said hydrophilic layer is formed; ~~and~~

~~laminating the previously formed~~ positioning said diffusion electrode on said electrode catalyst layer of said laminated body ~~through~~ via said hydrophilic layer; and ~~[[,]]~~

pressing said laminated body and said diffusion electrode together ~~the two~~ under heating, ~~so as~~ to integrate said laminated body and said diffusion electrode.

2. **(Original)** The method for producing a membrane-electrode structure according to claim 1, wherein said second slurry comprises a pore-forming material.

3. **(Original)** The method for producing a membrane-electrode structure according to claim 1, wherein said catalyst paste comprises a pore-forming material.

4. **(Currently Amended)** The method for producing a membrane-electrode structure according to claim 1, wherein each of said catalyst paste and said second slurry comprises a pore-forming material, and wherein said hydrophilic layer and said electrode catalyst layer are formed using a ~~such that~~ the ratio of the a volume of pores with a pore size of 0.01 to 1  $\mu\text{m}$  formed in said electrode catalyst layer by said pore-forming material to the a volume of pores with a pore size of 0.01 to 1  $\mu\text{m}$  formed in said hydrophilic layer by said pore-forming material that is less than 1.0.

5. **(Currently Amended)** The method for producing a membrane-electrode structure according to claim 1, wherein said hydrophilic layer and said electrode catalyst layer are formed using a ~~such that~~ the ratio of the a weight of

an said ion conducting material contained in said electrode catalyst layer to the a weight of an said ion conducting material ~~contained~~ in said hydrophilic layer that is set within the a range of 1.0 to 1.4.

6. **(Currently Amended)** The method for producing a membrane-electrode structure according to claim 1, wherein said hydrophilic layer and said electrode catalyst layer are formed using a ~~such that the~~ ratio of the a weight of solid content in said electrode catalyst layer to the a weight of solid content in said hydrophilic layer that is set within the a range of 1.0 to 3.5.

7. **(Currently Amended)** The method for producing a membrane-electrode structure according to claim 1, ~~which comprises applying said second slurry on said water repellent layer and drying the same, so as to form a~~ wherein said hydrophilic layer has a ~~having the~~ maximum height of surface roughness,  $R_{max}$ , of 40  $\mu\text{m}$  or less.

8. **(Currently Amended)** The method for producing a membrane-electrode structure according to claim 7, wherein said hydrophilic layer ~~is formed such that it has a surface roughness in which the~~ ratio of the a surface area to the a unit area that is 1.25 or less.

9. **(Currently Amended)** The method for producing a membrane-electrode structure according to claim 7, wherein ~~said water repellent layer and said hydrophilic layer are formed such that the~~ a differential pressure between one side of said diffusion electrode and the other side thereof is set within the a range between 100 and 300 mmAq, when the air is supplied at a flow rate of 0.5 L/cm<sup>2</sup>/min in the a direction of a the thickness of said diffusion electrode.

10. **(Currently Amended)** The method for producing a membrane-electrode structure according to claim 1, wherein said polymer electrolyte membrane is formed from a sulfonated polyarylene based polymer solution, and when said catalyst paste comprises catalyst particles consisting of a catalyst supported by carbon particles, an organic solvent solution containing a perfluoroalkylene sulfonic acid polymer, and a pore-forming material,

said electrode catalyst layer is dried ~~to such an extent that the~~ wherein a content of the solvent becomes 20% or less by weight based on the a total weight of said electrode catalyst layer, and the dried electrode catalyst layer is then thermally transferred onto and connected to said polymer electrolyte membrane.

11. **(Currently Amended)** The method for producing a membrane-electrode structure according to claim 10, wherein ~~said thermal transfer is carried out~~ the dried electrode catalyst layer is thermally transferred onto and connected to said polymer electrolyte membrane under a pressure within ~~the~~ a range of 1 to 5 MPa.

12. **(Currently Amended)** The method for producing a membrane-electrode structure according to claim 10, wherein said catalyst paste is applied on a surface of said sheet substrate ~~whose surface has~~ having a contact angle to water of 55° to 105°.

13. **(Currently Amended)** The method for producing a membrane-electrode structure according to claim 10, wherein when said diffusion electrode is ~~laminated~~ placed on each electrode catalyst layer and ~~they are~~ then pressed

under heating, ~~the~~ and wherein said diffusion electrode and said laminated body are pressured under an applied pressure is set within the a range of 0.5 to 4 MPa.

Claims 14-16 (**Cancelled**).

17. (**New**) The method for producing a membrane-electrode structure according to claim 1, wherein the membrane-electrode assembly is incorporated in a polymer electrolyte fuel cell.